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human. The service this master has thus rendered to bryology will lead all to keep him in grateful memory, and pay him the respect he deserves for his unselfish devotion to science.

Only a brief notice of the more striking departures from current views is possible here. Every one will be struck with the position the author assigns to the Sphagnaceae, which he places after Leucobryaceae, Group 12, following with Funarioideae, Group 14. After a careful characterization of the group, he argues that there is no valid ground for separating these mosses from the Bryineae proper.

The other departure from contemporary views, is conditioned by his position as a "Centralist," to use Dr. Schliephacke's term, who considers that "decentralization, that is, the separation of larger genera into several smaller ones, has become, so to speak, a trait of modern times." Dr. Mueller held to fewer centers. As a result, many names recognized as of generic value by others, appear as section names under his genera. Whether his views are finally accepted or not, his discussions, including all possible criticisms, all available morphological and historical considerations, will prove of the greatest value to all moss students.—*John M. Holzinger.*

DISCELIUM NUDUM (Dicks.) Brid. IN NEW JERSEY.

During the latter part of November, 1896, while botanizing along the railroad about a mile above Stockton, N. J., my attention was attracted by a blueish-green protonemal growth which appeared in patches on the bottom of an excavation in the railroad bank. On the filaments of this growth were minute buds from which sporophytes were just commencing to shoot. Being unable to identify the plant at this time, a month later I visited the spot again, when I found the capsules, although quite immature, yet sufficiently developed to make a diagnosis possible, especially by the aid of the calyptras, which were clasping the stems just below the capsules. This was indeed the rare *Discelium nudum*, not before known from New Jersey.

The veteran bryologist, Mr. E. A. Rau, informs me that this moss was first collected many years ago in this country at Painesville, Ohio, by Dr. Beardslee, and that this remained the only locality until he collected it near Bethlehem, Pa., May 19, 1873. About two weeks later, Dr. Francis Wolle found it in another locality, not far, however, from Mr. Rau's. So far as is known, these were the only localities in this country for it until found in New Jersey. In Europe it appears to be nearly or quite as rare.

Discelium nudum is usually found along the line of excavations, especially rail and wagon roads, on a hard sandy clay substratum, in the basin-like depressions of which muddy water settles, and drying up, leaves a sedimentaceous layer. It is on this during the latter part of autumn that the protonemata appear, and although the capsules make their appearance during the early part of winter, they do not mature until the following April or May. When I visited the locality above referred to, about the middle of April, the greenish color of the plants

had disappeared, the plants themselves were mostly overturned by the winter's alternate freezings and thawings, and had I not known the exact spot, I would have had great difficulty in finding the moss. The following summer the banks unfortunately fell in, and in consequence our rarity disappeared.—G. N. Best.

THE PERISTOME—I.

By A. J. GROUT.

The peristome, besides being one of the most beautiful of microscopic objects, is also one of the parts most carefully considered in classifying mosses. The details of the differences in development and structure of the various types of peristomes have never been presented in English in a popular form. M. Philibert in the *Revue Bryologique* has given a masterly presentation of the subject, but it is in French, and too extended and technical to be of popular interest.

This series of articles will be based largely on the work of Schimper and Philibert, but will in no sense be a translation of either. Free use will be made of Schimper's illustrations published in his various works, and these will be supplemented by original drawings.

THE simplest type of peristome is that of *Georgia* (*Tetraphis*), where the tissue which fills the operculum splits into four equal parts, as is shown in the accompanying figure. The operculum is composed of a single layer of cells, and is easily deciduous.

It is an interesting fact that in *Andreaea* and *Georgia*, which have a thalloid protonema indicating a close relationship to the hepatics, the capsule divides into four parts. In *Andreaea* the whole capsule dehisces as in the hepatics; in *Georgia*, only that portion of the tissue lying within the operculum. Prof. D. H. Campbell in his *Structure and Development of the Mosses and Ferns*, states that he considers this resemblance an accident. I am not so sure that this is the case. If he be right, the division of these capsules into four parts, and the division of all moss peristomes into multiples of four, may possibly be explained by the regularity of the divisions of the two-sided apical cell from which the sporophyte is developed. It will readily be seen that in *Georgia* no spores are found within the operculum. This is true of mosses having any other type of peristome. In all other types, the central tissue forms the columella, which in most cases shrinks up into a small piece of tissue upon the falling of the operculum.

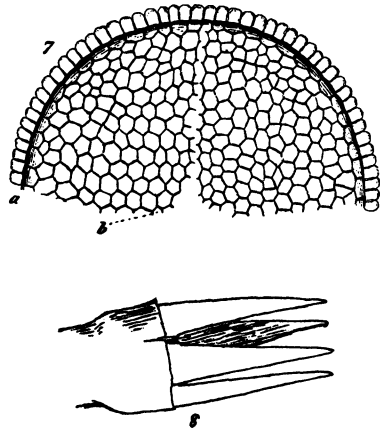


Fig. 1.